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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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7590 01/27/2004 SUN CHEMICAL CORPORATION 222 BRIDGE PLAZA SOUTH FORT LEE, NJ 07024			EXAMINER SRIKISHN, CALLIE E	
			ART UNIT 1714	PAPER NUMBER

DATE MAILED: 01/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/034,004

Examiner

Cedric E. Shosho

Applicant(s)

MODI ET AL.

Art Unit

1714

The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(e). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL.
- 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8-36 is/are rejected.
- 7) ☒ Claim(s) 7 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-648)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4/23/02.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 35 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 35, which depends on claim 32, recites "the molten pigment dispersion is added to the molten varnish during step (III)" while claim 32 recites in step (III) "adding the pigment dispersion to the molten varnish". Thus, the scope of claim 35 is confusing because it appears that claim 32 already discloses adding the pigment dispersion to the molten varnish. It is not clear what the difference is between claims 32 and 35. Clarification is requested.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4, 8-9, 13, 16, 22, and 28-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Johnson (U.S. 4,280,939).

Johnson discloses flexographic hot melt ink comprising 50-80% pigment, 2-20% ethylene vinyl acetate copolymer which has melt index of 20-400 g/10 min and amount of vinyl acetate of, for instance, 18%, 5-25% wax and/or plasticizer, 4-20% hydrocarbon resin, up to 5% dispersant, and stearyl alcohol which is a solid linear alcohol. The wax includes animal wax and polyethylene wax. There is also disclosed a method of flexographic printing comprising providing the above ink, heating the ink to 82-149 °C, and then printing (col.4, line 10, col.4, line 61-col.5, line 11, col.5, lines 28-58 and 65, col.6, line 57, and col.8, lines 3-9).

Although there is no disclosure in Johnson of the melting point of the ink or that the solid ink forms molten ink with viscosity of 100-1200 cP when heated to temperature between 90-135 °C, given that Johnson disclose flexographic hot melt ink comprising same type and amounts of ingredients as presently claimed, it is clear that such ink would inherently possess melting point and viscosity as presently claimed.

In light of the above, it is clear that Johnson anticipate the present claims.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (U.S. 4,280,939) in view of Elwakil (U.S. 5,574,078) and Herten et al. (U.S. 4,853,427)

The disclosure with respect to Johnson in paragraph 4 above is incorporated here by reference.

The difference between Johnson and the present claimed invention is the requirement in the claims of ethylene-acrylic acid copolymer.

Elwakil, which is drawn to hot melt ink, disclose the use of ethylene-acrylic acid copolymer known under the tradename AC 580 in order to enhance gloss (col.14, lines 54-63). It

is well known, as found in Herten et al., that AC 580 is ethylene-acrylic acid copolymer that possesses acid number of 80 and viscosity of 650 cP at 140 C (col.7, lines 11-17).

In light of the motivation for using ethylene-acrylic acid copolymer disclosed by Elwakil as described above, it therefore would have been obvious to one of ordinary skill in the art to use such copolymer in the ink of Johnson in order to produce ink with enhanced gloss, and thereby arrive at the claimed invention.

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (U.S. 4,280,939) in view of Kruse (U.S. 5,112,398).

The disclosure with respect to Johnson in paragraph 4 above is incorporated here by reference.

The difference between Johnson and the present claimed invention is the requirement in the claim of ethylene-vinyl acetate copolymer comprising 40% vinyl acetate.

Johnson discloses the use of ethylene-vinyl acetate possessing melt index of 20-400 g/10 min and vinyl acetate content of, for instance, 18%, however, there is no disclosure of ethylene-vinyl acetate comprising 40% vinyl acetate as presently claimed.

Kruse, which is drawn to ink composition, discloses the use of ethylene-vinyl acetate comprising 40% vinyl acetate given that such copolymer adheres well to substrate and binds colorant present in the ink (col.4, lines 36-41 and 63-66).

In light of the motivation for using specific type of ethylene-vinyl acetate disclosed by Kruse as described above, it therefore would have been obvious to one of ordinary skill in the art

to use such ethylene-vinyl acetate in the ink of Johnson in order to produce ink that adheres well to substrate, and thereby arrive at the claimed invention.

9. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (U.S. 4,280,939) in view of Oliver et al. (U.S. 5,593,486).

The disclosure with respect to Johnson in paragraph 4 above is incorporated here by reference.

The difference between Johnson and the present claimed invention is the requirement in the claims of highly branched hydrocarbon wax.

Oliver et al., which is drawn to hot melt ink, disclose the use of highly branched hydrocarbon wax possessing number average molecular weight of 520 in order to produce ink with high optical transmission, hue, and chroma as well as to produce ink able to survive severe storage conditions without melting or offset (col.8, lines 25-27, col.8, line 67-col.9, line 2, and col.10, lines 43-47). Although there is no explicit disclosure regarding the softening point or viscosity of the highly branched hydrocarbon wax, given that Oliver et al. disclose the use of wax known under the tradename Vybar 253 which is identical to the highly branched hydrocarbon wax used in the present invention, it is clear that such wax would intrinsically possess softening point and viscosity as presently claimed.

In light of the motivation for using highly branched hydrocarbon wax disclosed by Oliver et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such wax in the ink of Johnson in order to produce ink with high optical transmission, hue, and chroma as well as good storage stability, and thereby arrive at the claimed invention.

10. Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (U.S. 4,280,939) in view of Oliver et al. (U.S. 5,593,486) and *Ethylene Homopolymers-Polywax*.

The disclosure with respect to Johnson in paragraph 4 above is incorporated here by reference.

The difference between Johnson and the present claimed invention is the requirement in the claims of specific type of polyethylene wax.

Oliver et al., which is drawn to hot melt ink, disclose the use of polyethylene wax possessing number average molecular weight of 1000 in order to produce ink with high optical transmission, hue, and chroma as well as to produce ink able survive severe storage conditions without melting or offset (col.8, lines 25-27, col.9, lines 34-48, and col.10, lines 43-47). Although there is no explicit disclosure regarding the molecular weight distribution or melting point of the wax, Oliver et al. disclose the use of wax known under the tradename Polywax, which is well known, as found in *Ethylene Homopolymers- Polywax* (retrieved from the Internet: <URL: [www.bakerhughes.com/bakerpetrolite /polymers/ethylene_homopolymers](http://www.bakerhughes.com/bakerpetrolite/polymers/ethylene_homopolymers)>), as possessing molecular weight distribution of approximately 1.1 and melting point of 80-132 °C.

In light of the motivation for using specific polyethylene wax disclosed by Oliver et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such wax in the ink of Johnson in order to produce ink with high optical transmission, hue, and chroma as well as good storage stability, and thereby arrive at the claimed invention.

11. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (U.S. 4,280,939) in view of either Oliver et al. (U.S. 5,593,486) or Ouchi et al. (U.S. 6,106,602).

The disclosure with respect to Johnson in paragraph 4 above is incorporated here by reference.

The difference between Johnson and the present claimed invention is the requirement in the claims of solid linear alcohol.

Oliver et al., which is drawn to hot melt ink, disclose the use of solid linear alcohol possessing melting point of 78-106 °C and number average molecular weight of 550 in order to produce ink with high optical transmission, hue, and chroma as well as to produce ink able to survive severe storage conditions without melting or offset (col.8, line 67-col.9, line 2, col.9, lines 19-34, and col.10, lines 43-47). Although there is no explicit disclosure regarding the hydroxyl number or viscosity of the solid linear alcohol, given that Oliver et al. disclose the use of solid linear alcohol known under the tradename Unilin 550 which is identical to the solid linear alcohol used in the present invention, it is clear that such alcohol would intrinsically possess hydroxyl number and viscosity as presently claimed.

Alternatively, Ouchi et al., which is drawn to hot melt ink, disclose the use of alcoholic wax possessing hydroxyl number of 20-150, viscosity of 5-50 mPas at 100-150 °C, molecular weight of 200-1500, and melting point of 50-120 °C in order to produce ink with good stability (col.2, lines 3-19 and 53-56 and col.3, line 59-col.4, line 31).

In light of the motivation for using solid linear alcohol disclosed by either Oliver et al. or Ouchi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such solid linear alcohol in the ink of Johnson in order to produce ink with high

optical transmission, hue, and chroma as well as good storage stability, and thereby arrive at the claimed invention.

12. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (U.S. 4,280,939) in view of Sawada (U.S. 5,560,765).

The disclosure with respect to Johnson in paragraph 4 above is incorporated here by reference.

The difference between Johnson and the present claimed invention is the requirement in the claim of specific type of animal wax.

Johnson discloses the use of animal wax, however, there is no explicit disclosure of specific types of animal wax.

Sawada, which is drawn to hot melt ink, disclose the use of spermaceti wax in order to control the thermal characteristics and viscosity of the ink (col.2, lines 38-42 and col.3, line 30).

In light of the motivation for using spermaceti wax disclosed by Sawada as described above, it therefore would have been obvious to one of ordinary skill in the art to use spermaceti as the animal wax in Johnson in order to control the thermal characteristics and viscosity of the ink, and thereby arrive at the claimed invention.

13. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (U.S. 4,280,939) in view of Stone et al. (U.S. 6,645,282).

The disclosure with respect to Johnson in paragraph 4 above is incorporated here by reference.

The difference between Johnson and the present claimed invention is the requirement in the claim of specific type of dispersant.

Johnson discloses the use of dispersant, however, there is no explicit disclosure of hyperdispersant as presently claimed.

Stone et al., which is drawn to flexographic hot melt ink, disclose the use of hyperdispersant, known under the tradename Solsperse which is identical to that used in the present invention, in order to disperse pigment (col.3, lines 20-24).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use hyperdispersant as the dispersant in Johnson, and thereby arrive at the claimed invention.

14. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (U.S. 4,280,939) in view of Jaeger et al. (U.S. 4,889,560).

The disclosure with respect to Johnson in paragraph 4 above is incorporated here by reference.

The difference between Johnson and the present claimed invention is the requirement in the claim of specific plasticizer.

Johnson discloses the use of plasticizer, however, there is no disclosure of dicyclohexyl phthalate as required in the present claim.

Jaeger et al., which is drawn to hot melt ink, disclose the use of dicyclohexyl phthalate plasticizer in order to increase the flexibility of the ink (col.4, lines 10-21).

In light of the motivation for using dicyclohexyl phthalate plasticizer disclosed by Jaeger et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use dicyclohexyl phthalate as the plasticizer in Johnson in order to produce ink with increased flexibility, and thereby arrive at the claimed invention.

15. Claims 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (U.S. 4,280,939) in view of Kakuta et al. (U.S. 6,283,031).

The disclosure with respect to Johnson in paragraph 4 above is incorporated here by reference.

The difference between Johnson and the present claimed invention is the requirement in the claims of heating the substrate before printing followed by cooling the substrate after printing.

Johnson discloses using flexographic printing to print ink on substrate, however, there is no disclosure of heating or cooling the substrate.

Kakuta et al., which is drawn to hot melt ink suitable for use in flexographic printing, disclose heating the substrate before printing in order to optimize the shape of the ink dots (col.4, lines 2-6 and 60-62 and col.9, lines 56-58). Although there is no disclosure of cooling the substrate after printing, it would have been obvious to, as well as within the skill level of, one of ordinary skill in the art to recognize that the substrate must be cooled after printing in order to solidify the ink on the substrate so that the ink will adhere to the substrate quickly and not run or smudge.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to heat the substrate before printing the ink followed by cooling the substrate after printing in the flexographic printing process of Johnson in order to optimize the shape of the ink dots and then quickly adhere the ink to the substrate, and thereby arrive at the claimed invention.

16. Claims 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (U.S. 4,280,939) in view of Elwakil (U.S. 5,574,578), Oliver et al. (U.S. 5,593,486), Stone et al. (U.S. 6,645,282), and Jaeger et al. (U.S. 4,889,560).

Johnson discloses flexographic hot melt ink comprising pigment, wax and/or plasticizer, up to 5% dispersant, and stearyl alcohol which is a solid linear alcohol (col.4, line 10, col.4, line 61-col.5, line 11, col.5, lines 28-58 and 65, col.6, line 57, and col.8, lines 3-9).

Although there is no disclosure in Johnson of the melting point of the ink or that the solid ink forms molten ink with viscosity of 100-1200 cP when heated to temperature between 90-135 °C, given that Johnson disclose flexographic hot melt ink comprising same type and amounts of ingredients as presently claimed, it is clear that such ink would intrinsically possess melting point and viscosity as presently claimed.

The difference between Johnson and the present claimed invention is the requirement in the claims of (a) ethylene-acrylic acid copolymer, (b) highly branched hydrocarbon wax, (c) specific type of dispersant, and (d) specific type of plasticizer.

With respect to difference (a), Elwakil, which is drawn to hot melt ink, disclose the use of ethylene-acrylic acid copolymer known under the tradename AC 580 in order to enhance gloss (col.14, lines 54-63).

With respect to difference (b), Oliver et al., which is drawn to hot melt ink, disclose the use of highly branched hydrocarbon wax in order to produce ink with high optical transmission, hue, and chroma as well as to produce ink able survive severe storage conditions without melting or offset (col 8, lines 25-27, col.8, line 67-col.9, line 2, and col.10, lines 43-47).

With respect to difference (c), Johnson discloses the use of dispersant, however, there is no explicit disclosure of hyperdispersant as presently claimed.

Stone et al., which is drawn to flexographic hot melt ink, disclose the use of hyperdispersant, known under the tradename Solsperse which is identical to that used in the present invention, in order to disperse pigment (col.3, lines 20-24).

With respect to difference (d), Johnson discloses the use of plasticizer, however, there is no disclosure of dicyclohexyl phthalate as required in the present claim.

Jaeger et al., which is drawn to hot melt ink, disclose the use of dicyclohexyl phthalate plasticizer in order to increase the flexibility of the ink (col.4, lines 10-21).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use ethylene-acrylic acid copolymer, highly branched hydrocarbon wax, hyperdispersant as the dispersant and dicyclohexyl phthalate as the plasticizer in Johnson in order to produce ink with high optical transmission, hue, and chroma, good storage stability, enhanced gloss, and increased flexibility that effectively disperses pigment, and thereby arrive at the claimed invention.

17. Claims 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (U.S. 4,280,939) in view of Stone et al. (U.S. 6,645,282) and Jaeger et al. (U.S. 4,889,560).

Johnson discloses flexographic hot melt ink comprising pigment, ethylene vinyl acetate copolymer, wax and/or plasticizer, dispersant, and stearyl alcohol which is a solid linear alcohol. The wax includes polyethylene wax (col.4, line 10, col.4, line 61-col.5, line 11, col.5, lines 28-58 and 65, col.6, line 57, and col.8, lines 3-9).

Although there is no disclosure in Johnson of the melting point of the ink or that the solid ink forms molten ink with viscosity of 100-1200 cP when heated to temperature between 90-135 °C, given that Johnson disclose flexographic hot melt ink comprising same type and amounts of ingredients as presently claimed, it is clear that such ink would intrinsically possess melting point and viscosity as presently claimed.

The difference between Johnson and the present claimed invention is the requirement in the claims of (a) specific type of dispersant and (b) specific type of plasticizer.

With respect to difference (a), Johnson discloses the use of dispersant, however, there is no explicit disclosure of hyperdispersant as presently claimed.

Stone et al., which is drawn to flexographic hot melt ink, disclose the use of hyperdispersant, known under the tradename Solsperse which is identical to that used in the present invention, in order to disperse pigment (col.3, lines 20-24).

With respect to difference (b), Johnson discloses the use of plasticizer, however, there is no disclosure of dicyclohexyl phthalate as required in the present claim.

Jaeger et al., which is drawn to hot melt ink, disclose the use of dicyclohexyl phthalate plasticizer in order to increase the flexibility of the ink (col.4, lines 10-21).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use hyperdispersant as the dispersant and dicyclohexyl phthalate as the plasticizer in

Johnson in order to produce ink that effectively disperses pigment and possesses increased flexibility and thereby arrive at the claimed invention.

18. Claims 1-2, 13, 18-23, 28-29, and 32-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stone et al. (U.S. 6,645,282) in view of either Oliver et al. (U.S. 5,593,486) and Ouchi et al. (U.S. 6,106,602).

Stone et al. disclose flexographic hot melt ink comprising wax such as linear polyethylene wax, pigment, hydrocarbon resin, hyperdispersant, and plasticizer such as dicyclohexyl phthalate. It is further disclosed that the ink is suitable for use in flexographic printing and that the ink is prepared in two steps. The method of producing the ink comprises (i) preparing colorant dispersion by combining all the dispersion ingredients such as plasticizer and dispersant, heating the mixture to melting point of the ink, stirring until the mixture is homogeneous, then adding pigment, (ii) combining remaining ink ingredients until its melting temperature is reached and stirring until homogenous, and (iii) adding (i) to (ii). It is further disclosed that the dispersion (i) is collected and cooled at room temperature before adding mixture of step (ii) (col.1, lines 6-8, col.2, lines 18, 35-40, and 51, col.2, line 57-col.3, line 7, col.3, lines 15-30, and col.4, lines 1-15).

The difference between Stone et al. and the present claimed invention is the requirement in the claims of solid linear alcohol.

Oliver et al., which is drawn to hot melt ink, disclose the use of solid linear alcohol possessing melting point of 78-106 °C and number average molecular weight of 550 in order to produce ink with high optical transmission, hue, and chroma as well as to produce ink able

survive severe storage conditions without melting or offset (col.8, line 67-col.9, line 2, col.9, lines 19-34, and col.10, lines 43-47). Although there is no explicit disclosure regarding the hydroxyl number or viscosity of the solid linear alcohol, given that Oliver et al. disclose the use of solid linear alcohol known under the tradename Unitin 550 which is identical to the solid linear alcohol of the present invention, it is clear that such alcohol would intrinsically possess hydroxyl number and viscosity as presently claimed.

Alternatively, Ouchi et al., which is drawn to hot melt ink, disclose the use of alcoholic wax possessing hydroxyl number of 20-150, viscosity of 5-50 mPas at 100-150 °C, molecular weight of 200-1500, and melting point of 50-120 °C in order to produce ink with good stability (col.2, lines 3-19 and 53-56 and col.3, line 59-col.4, line 31).

In light of the motivation for using solid linear alcohol disclosed by either Oliver et al. or Ouchi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such solid linear alcohol in the ink of Stone et al. in order to produce ink with high optical transmission, hue, and chroma as well as good storage stability, and thereby arrive at the claimed invention.

19. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stone et al. in view of either Ouchi et al. or Oliver et al. as applied to claims 1-2, 13, 18-23, 28-29, and 32-36 above, and further in view of Oliver et al. (U.S. 5,593,486).

The difference between Stone et al. in view of either Ouchi et al. or Oliver et al. and the present claimed invention is the requirement in the claims of highly branched hydrocarbon wax.

Oliver et al., which is drawn to hot melt ink, disclose the use of highly branched hydrocarbon wax possessing number average molecular weight of 520 in order to produce ink with high optical transmission, hue, and chroma as well as to produce ink able survive severe storage conditions without melting or offset (col.8, lines 25-27, col.8, line 67-col.9, line 2, and col.10, lines 43-47). Although there is no explicit disclosure regarding the softening point or viscosity of the highly branched hydrocarbon wax, given that Oliver et al. disclose the use of wax known under the tradename Vybar 253 which is identical to the highly branched hydrocarbon wax of the present invention, it is clear that such wax would intrinsically possess softening point and viscosity as presently claimed.

In light of the motivation for using highly branched hydrocarbon wax disclosed by Oliver et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such wax in the ink of Stone et al. in order to produce ink with high optical transmission, hue, and chroma as well as good storage stability, and thereby arrive at the claimed invention.

20. Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stone et al. in view of either Ouchi et al. or Oliver et al. as applied to claims 1-2, 13, 18-23, 28-29, and 32-36 above, and further in view of Oliver et al. (U.S. 5,593,486) and *Ethylene Homopolymers-Polywax*.

The difference between Stone et al. in view of either Ouchi et al. or Oliver et al. and the present claimed invention is the requirement in the claims of specific type of polyethylene wax.

Oliver et al., which is drawn to hot melt ink, disclose the use of polyethylene wax possessing number average molecular weight of 1000 in order to produce ink with high optical

transmission, hue, and chroma as well as to produce ink able survive severe storage conditions without melting or offset (col.8, lines 25-27, col.9, lines 34-48, and col.10, lines 43-47).

Although there is no explicit disclosure regarding the molecular weight distribution or melting point of the wax, Oliver et al. disclose the use of wax known under the tradename Polywax, which is well known, as found in *Ethylene Homopolymers- Polywax* (retrieved from the Internet: <URL: www.bakerhughes.com/bakerpetrolite/polymers/ethylene_homopolymers>), as possessing molecular weight distribution of approximately 1.1 and melting point of 80-132 °C.

In light of the motivation for using polyethylene wax disclosed by Oliver et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such wax in the ink of Stone et al. in order to produce ink with high optical transmission, hue, and chroma as well as good storage stability, and thereby arrive at the claimed invention.

21. Claims 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stone et al. in view of either Ouchi et al. or Oliver et al. as applied to claims 1-2, 13-23, 28-29, and 32-36 above, and further in view of Stone et al. in view of Kakuta et al. (U.S. 6,283,031).

The difference between Stone et al. in view of either Ouchi et al. or Oliver et al. and the present claimed invention is the requirement in the claims of heating the substrate before printing followed by cooling the substrate after printing.

Stone et al. disclose using flexographic printing to print ink on substrate, however, there is no disclosure of heating or cooling the substrate.

Kakuta et al., which is drawn to hot melt ink suitable for use in flexographic printing, disclose heating the substrate before printing in order to optimize the shape of the ink dots (col.4,

lines 2-6 and 60-62 and col.9, lines 56-58). Although there is no disclosure of cooling the substrate after printing, it would have been obvious to, as well as within the skill level of, one of ordinary skill in the art to recognize that the substrate must be cooled after printing in order to solidify the ink on the substrate so that the ink will adhere to the substrate quickly and not run or smudge.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to heat the substrate before printing the ink followed by cooling the substrate after printing in the flexographic printing process of Stone et al. in order to optimize the shape of the ink dots and then quickly adhere the ink to the substrate, and thereby arrive at the claimed invention.

22. **NOTE:** As set forth in amended 35 USC 103(c), subject matter which qualifies as prior art under one or more subsections (e), (f), and (g) of section 102 cannot be applied against the claimed invention if the prior art and the claimed invention "were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person." This rule change to 103(c) applies to any patent application filed on or after November 29, 1999. See Official Gazette, April 11, 2000. As noted in the Official Gazette, the "mere filing of a continuation application on or after November 29, 1999 will serve to exclude commonly owned 102(e) prior art that was applied, or could have been applied, in a rejection under 103 in the parent application."

Given that the filing date of the present application is subsequent to November 29, 1999, applicant is advised that a statement indicating that Stone et al. (U.S. 6,645,282) was commonly

owned at the time the present invention was made will be required to remove the rejection under 35 USC 103 utilizing Stone et al. See the Official Gazette Notice of April 11, 2000, 1233 OG 54.

Allowable Subject Matter

23. Claim 7 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 7 would be allowable if re-written in independent form as described above given that there is no disclosure in the "closest" prior art, namely, Johnson (U.S. 4,280,939), Stone et al. (U.S. 6,645,282), or Elwakil (U.S. 5,574,078) of hot melt ink comprising ethylene-acrylic acid possessing acid number of 120 and viscosity at 140 C of about 650 cP as required in present claim 7.

24. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Tan et al. (U.S. 2003/01086879) and Takeuchi et al. (U.S. 4,865,913) disclose flexographic hot melt ink comprising pigment, wax, and ethylene-vinyl acetate.

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Callie E. Shosho
Primary Examiner
Art Unit 1714

CS
1/15/04